

Amendments to the Specification:

Please replace the paragraph beginning at page 2, line 25, with the following rewritten paragraph:

In one aspect of the invention, a method of ~~at least partially filling~~ at least one microfluidic ~~channel element~~ of a microfluidic device with a gas or fluid is disclosed which comprises placing the microfluidic device in a vacuum chamber, applying a vacuum to the vacuum chamber, introducing the gas or fluid into the vacuum chamber while the microfluidic device remains under vacuum so that the microfluidic device is submerged in the gas or fluid, venting the at least one microfluidic channel of the microfluidic device element to the fluid, and ~~at least partially filling the at least one microfluidic channel element with at least one of a the gas or fluid while the at least one microfluidic channel remains under vacuum. The applying a vacuum to the at least one microfluidic channel of the microfluidic device preferentially comprises placing the microfluidic device in a vacuum chamber and applying a vacuum to the vacuum chamber.~~ The vacuum applied to the vacuum chamber can range from between about 0 and 102 kPa, for example, from between about 15 and 85 kPa, from between about 30 and 70 kPa, from between about 45 and 55 kPa, and from between about 0 and 5 kPa, for example. The step of ~~at least partially filling the at least one microfluidic channel element~~ with a gas or fluid can comprise, for example, ~~at least partially filling the at least one microfluidic channel element~~ with at least one fluid selected from the group comprising water, buffer, EDTA solution, DMSO, PEG, polyacrylamide, and NaOH solution, or at least one inert gas, such as carbon dioxide or nitrogen, or a combination of any one or more of the fluids and gases.

Please replace the paragraph beginning at page 14, line 27, with the following rewritten paragraph:

Currently, one ~~primarily primary~~ way to accomplish wetting and filling of microfluidic devices (especially ones incorporating capillary elements) is to distribute carbon dioxide through each microfluidic device to be wetted and filled. Carbon dioxide is flowed into a microfluidic device and allowed to diffuse into all areas. Diffusion into areas is especially important in regions/areas where flow of carbon dioxide is not an option (e.g., "dead-leg areas")

areas, e.g., microchannels, having no end outlet, such as “T” formations). Such actions are usually done to each microfluidic device singularly. The carbon dioxide is allowed to fully saturate the microfluidic elements of the device (i.e., to permeate through all microchannels, capillary elements, etc.). The time required for the carbon dioxide to diffuse through all of the elements of the microfluidic device depends upon several factors including, e.g., the size, complexity and number of the microfluidic elements involved in the device (i.e., greater complexity, etc. can require a greater diffusing time for the carbon dioxide). Once the carbon dioxide is diffused throughout the elements of the microfluidic device, a solution of sodium hydroxide is pulled through the microfluidic device. As the sodium hydroxide solution is pulled through the device, the carbon dioxide dissolves into, and reacts with, the solution, thus wetting and filling the fluidic elements of the microfluidic device (e.g., the various microchannels, etc. within the microfluidic device). Other techniques involve simply pushing or pulling fluid through the microfluidic elements of a microfluidic device (i.e., using pressure or vacuum respectively).